SAMSUNG

# MICROWAVE OVEN

**DE7712N**

# SERVICE Manual

## MICROWAVE OVEN

| | |
|---|---|
| Timer | 30 Minutes |
| Operationg Voltage | 24V DC |
| Breaking Voltage | Min.21.5V, Max.29.5V |
| Input Current | 34A |
| Power Consumption | 820W |
| Operating frequency | 2,450MHz |
| Output Power | 500W (IEC-705) |
| Main Fuse | 32V DC, 80A |
| Dimensions(WxHxD) | |
| Outside(mm) | 490 (W) X 282 (H) X 351 (D) |
| Oven(mm) | 306 (W) X 190 (H) X 348 (D) |
| Net/Gross Weight | 10.5 / 12.5 kg Approx. |

**WAECO**

# PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(a) Do not operate or allow the oven to be operated with the door open.

(b) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:
   (1) Interlock operation,
   (2) proper door closing,
   (3) seal and sealing surfaces (arcing, wear, and other damage),
   (4) damage to or loosening of hinges and latches,
   (5) evidence of dropping or abuse.

(c) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.

(d) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.

(e) A Microwave leakage check to verify compliance with the Federal performance standard should be performed on each oven prior to release to the owner.

# 1. Precaution

Follow these special safety precautions. Although the microwave oven is completely safe during ordinary use, repair work can be extremely hazrdous due to possible exposure to microwave radiation, as well as potentially lethal high voltages and currents.

## 1-1 Safety precautions (⚠)

1. All repairs should be done in accordance with the procedures described in this manual.

2. Microwave emission check should be performed prior to servicing if the oven is operative.

3. If the oven operates with the door open:
   Instruct the user not to operate the oven and contact the manufacturer and the center for devices and radiological health immediately.

4. Notify the Central Service Center if the microwave leakage exceeds 5mW/cm$^2$

5. Make sure that there are no cabinet openings through which people –particularly children –might insert objects and contact dangerous voltages. Examples: Lamp hole, ventilation slots.

6. Inform the manufacturer of any oven found to have emission in excess of 5mW/cm$^2$, make repairs to bring the unit into compliance at no cost to owner and try to determine cause. Instruct owner not to use oven until it has been brought into compliance.

7. Service technicians should remove their watches while repairing an MWO.

8. To avoid any possible radiation hazard, replace parts in accordance with the wiring diagram. Also, use only the exact replacements for the following parts:
   Primary and secondary interlock monitor switch.

9. If the fuse is blown by the Interlock Monitor Switch:
   Replace all of the following at the same time:
   Primary, door sensing switch and power relay, as well as the Interlock Monitor Switch. The correct adjustment of these switches is described elsewhere in this manual. Make sure that the fuse has the correct rating for the particular model being repaired.

10. Some semiconductor ("olid state" devices are easily damaged by static electricity. Such components are called Elecrtrostatically Sensitive Devices (ESDs). Examples include integrated circuits and field-effect transistors. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground.

11. When checking the continuity of the switches or transformer, always make sure that the power is OFF, and one of the lead wires is disconnected.

12. Components that are critical for safety are indicated in the circuit diagram by shading, ⚠ or ⚠ .

13. Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

14. Install or place this appliance only in accordance with the installation instructions provided.

15. Do not operate this appliance if it has a damaged cord or plug, if it is not working properly, or if it has been damaged or dropped.

16. Do not immerse power cable in water.

17. Keep power cable away from heated surfaces.

# 1. Precautions (Continued)

## 1-2 General safety Requirements

18. If the oven is not going to be in use for a long period of time, disconnect it and store it in a cool, well ventilated place.

19. If the oven is going to be used and stored by another person, be sure to include the Owner's Manual along with the microwave oven.

20. This appliance is equipped with a condenser. Therefore, when relocating the oven, be sure to first disconnect the battery, wait 20 seconds, then disconnect the power cable connections.

21. Do not operate the oven if it does not work properly. Be sure to prevent an injury or damage to the appliance.

## 1-3 Special High Voltage Precautions

**PRECAUTION**

There exists HIGH VOLTAGE ELECTRICITY with high current capabilities in the circuits of the HIGH VOLTAGE TRANSFORMER secondary and filament terminals. It is extremely dangerous to work on or near these circuits with the oven energized.
DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

**PRECAUTION**

Never touch any circuit wiring with your hand nor with uninsulated tool during operation.

**PRECAUTION**

Servicemen should remove their watches whenever working close to or replacing the magnetron.

# 2. Microwave Oven Installation Requirements

## Requirements

The requirements for proper microwave oven operation are as follows:

- Operating Voltage: 24V
- Breaking Voltage: Min. 21.5V, Max. 29.5V
- Battery life must be at least 45Ah at 24V

If possible, connect the oven to a separate supply battery (a secondary battery).

## Supplied Items

Microwave oven, Turntable, Terminal Post Cover(plastic cover), Install bracket(Left/Right), 6-#5 Tap screws, 7-#4 screws and Owner's Manual. The battery connection power cable and safety fuse is not included.

## Items needed for Installation

Before installing the appliance, make sure you have the following items:

- 6-#5 Tap screws (The length of the screw is subject to the installation requirements. Refer to page 6)
- 2 connection power cables : one red, one black (refer to the page 8 for the length and size of the connection cables)
- Power cable terminal, power cable binder, and lectrical tape. Depending on the installation location, the following tools may be required.
- Stick ruler, chalk, hammer, and gimlet.
- Drill and borer
- Ring/Fork type spanner set
- Crimp pincers, soldering iron
- Screw driver

## Installation

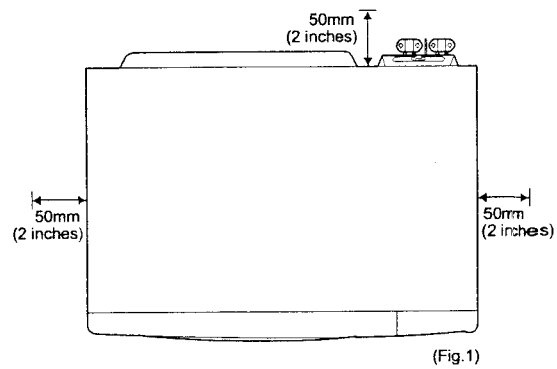
Installation Location Tips

- Before installing the oven, be sure to comply with the following:

  The installation location for the oven should be even, flat, and sturdy.

- Do not allow humidity or heat to affect the oven.
- Allow free space of about 50mm(2 inches)

  around the oven for ventilation (Fig.1).




(Fig.1)

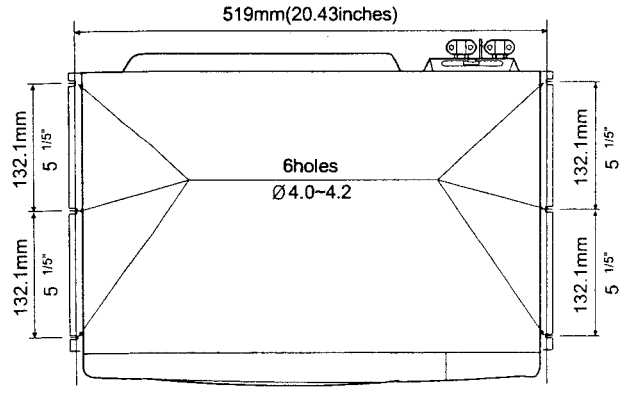
Microwave oven

# 2. Microwave Oven Installation Requirements (continued)

## Installation(Continued)

- Take the oven's weight into account. Check whether any protective measure such as a large support base is necessary or not.

- To determine hole location, refer to the dimensions in Fig. 2 and follow the instructions.




(Fig.2)

## WARNING

When installing the oven in a vehicle, make sure that the installation location is safe enough to avoid an injury. (including a vehicle's sudden stop or accident).

# 2. Microwave Oven Installation Requirements (continued)

## Installation(Continued)

To make a hole in an accurate location, create a mark in advance with a hammer and punch. Smooth any rough edges on the holes and apply rust proof treatment to them.

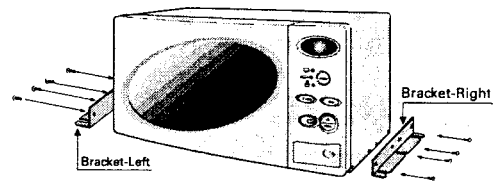
- Remove one screws securing outer panel of microwave oven(right side)
- Attach left and right brackets to the outer panel panel using 8 screws(Fig.1)
- Secure the microwave oven brackets to the frame which has drilled holes(Ø4.0~4.2) using 6 screws (Tap Screws).(Fig.2)
- Fig.3 shows how the microwave should look attached to the frame.

If the electrical wiring does not work after the oven is fastened tightly, first follow the "lectrical Wiring (Page 7-8)" instructions and then re-fasten the oven.

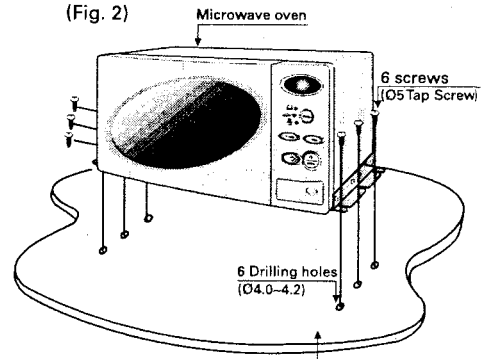
The oven must be fastened tightly to protect against vibration.

If do not want to use brackets, please attach 8screws(#4x12) on left and right side of the outer panel directly(Fig.4)

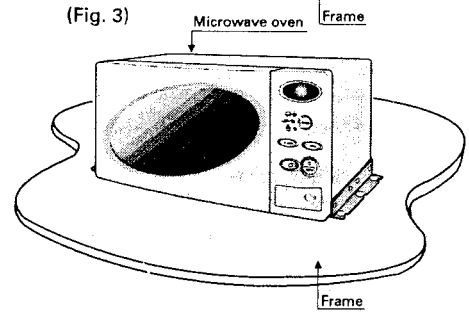
(Fig. 1)



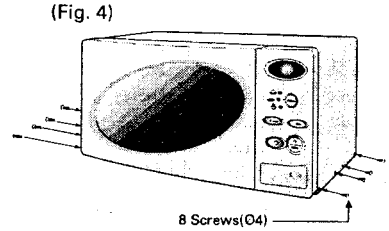

(Fig. 2)




(Fig. 3)




(Fig. 4)



# 2. Microwave Oven Installation Requirements (continued)

## Safety Requirements for Installation:

The operating voltage should comply with the voltage specified in the label of the microwave oven type attached to the back of the appliance.

### WARNING

This appliance is equipped with a capacitor. To remove or relocate the appliance, take the battery out and wait for about 20 seconds, and then disconnect the power cable connections. If the power cable is disconnected too soon, it may cause an electrical short circuit and discharge (spark).

It is a good idea to install an additional safety fuse to a positive(+) power cable. If the connection power cable is damaged or causes a short circuit, it means that the safety fuse can no longer prevent the appliance from being dam-aged (cable fire). The safety fuse should be installed as close to the battery as possible.

If the electrical cabling is not performed properly, it may cause an electrical short circuit, resulting in the following:

- Battery power cable may catch fire.
- Airbag may burst.
- Controller may work improperly.
- An electrical component may malfunction. (Signal lamp, Brake lamp, Horn, Ignition, Lighting, etc.).

To eliminate the danger of an electrical short circuit, always disconnect and isolate the battery negative terminal before using an electrical device in the vehicle. Also, in the case of a vehicle equipped with an additional battery, disconnect and isolate the negative(-) battery power cable.

### Precaution

When disconnecting and isolating the negative battery power cable, all the data stored in the memory of the vehicle's system will disappear.

Depending on equipment included in your vehicle, you may have to enter the following data again:

Ex) Vehicle audio password, vehicle clock, seat location, panel computer, and time switch.

## Electrical Wiring

Connection the power cable.

- Do not pull Power Cable forcibly.
- Do not t connect to a power supply other than 24V.
- Comply with the minimum diameter of the power cable as specified in the manual.
- Fasten the power cable properly.
- Install the power cable properly to prevent tripping over it.
- Install the power cable properly to prevent damage.
- Use one red (positive/+)and one black (negative/-)power cable to avoid confusion.

### Battery WARNING

- Improper connection of power cable wires (+,-polarity) causes the main fuse or safety fuse to disconnect in the microwave oven. Be sure to connect +, - polarity in the proper way.

- Connect the power cable securely.

If not, the oven may not function correctly and could cause damage to the vehicle.
Be sure to connect the cable with proper torque (30~50kg.cm)

Connect the oven to the user's battery (a secondary bat -tery)if possible. Connecting to the starter battery may overload the appliance, which in turn may cause the engine to not turn over.

- Make sure there is sufficient Battery Capacity. The battery capacity should be 45Ah for 24V operating voltage.

### Power Cable Size and Power Cable Length

For a 3m(118.1 inches) wire, the size should be a minimum 22mm$^2$(4AWG) for 24V of operating voltage.

For a power cable more than 3m(118.1 inches) in length,the size must be larger in order to reduce the voltage drop.

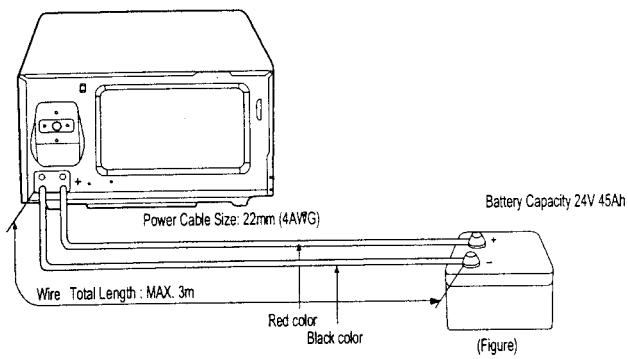
If the voltage drop is too much, the oven may not operate properly.

- If you have used the microwave oven for longer than 10minutes, keep your vehicles engine running for 2~3minutes to avoid battery drain.

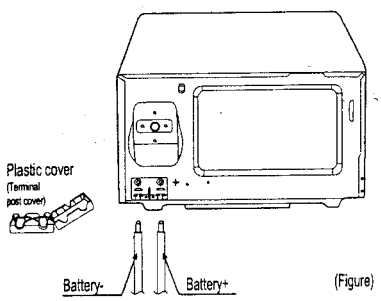
# 2. Microwave Oven Installation Requirements (continued)

## Connecting the Power Cables to the Oven

- Install the power cable clamp required for the battery connection to the connection power cable. 아니 not connect the power cable to the battery yet.
- Bring the power cable close to the oven.
- Strip about 20mm(0.79 inches) of electric coating off the power cable wire.
- Be careful not to damage the wire.
- Remove the plastic cover from the back of the oven.
- Attach the positive power cable (Battery +) to the red right insulating terminal on the oven.
- Attach the negative power cable (Battery -) to the left terminal.
- Connect the positive power cable (Battery +) to the battery first. Then, connect the negative power cable(Battery -) to the battery.
- Replace the plastic cover.
- In case of uninstalling the power cable, do it in exactly reverse order. .



(Figure)



(Figure)

## Battery Power Consumption for proper operation

Microwave oven will operate continuously for a maximum of 30 minutes off the battery.

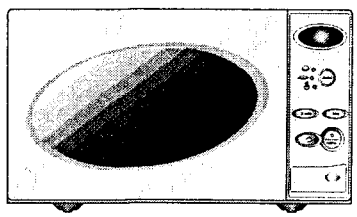
The battery life is subject to various conditions such as battery operating hours, battery charging status, ambient temperature, etc.

# 3. Your New Microwave Oven

## 3-1. Checking Parts and Setting Up Your Microwave Oven

### Checking Parts

Unpack your microwave oven and check to make sure that you have all the parts shown here. If any parts is missing or broken, call your dealer.

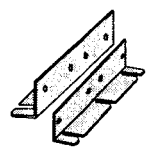


microwave oven

glass tray

instruction manual

roller guide ring



install bracket
(left/right)

install bracket
(6-#5 Tap Screws)

outer panel screws
(7-#4 Tap Screws)

### Setting Up Your Microwave Oven

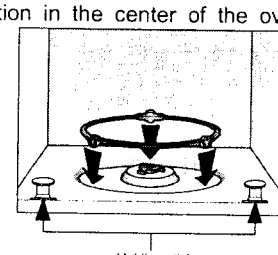
**1** Once connected to the power supply the display on your oven will show:

*Make sure there is adequate ventilation for your oven by leaving at least 2 inches of space behind, above, and to the side of the oven.*

**2** Open the oven door by pressing the button below the control panel.

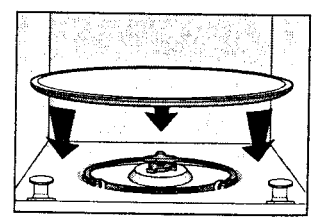
**3** Wipe the inside of the oven with a damp cloth.

**4** Place the pre-assembled ring in the indentation in the center of the oven.



Holding stick
(a device which prevents the grass trayfrom its bounce.)

**5** Place the glass tray on top of the ring so that the three glass tabs in the center of the tray fit securely into the tabs on the floor of the oven.

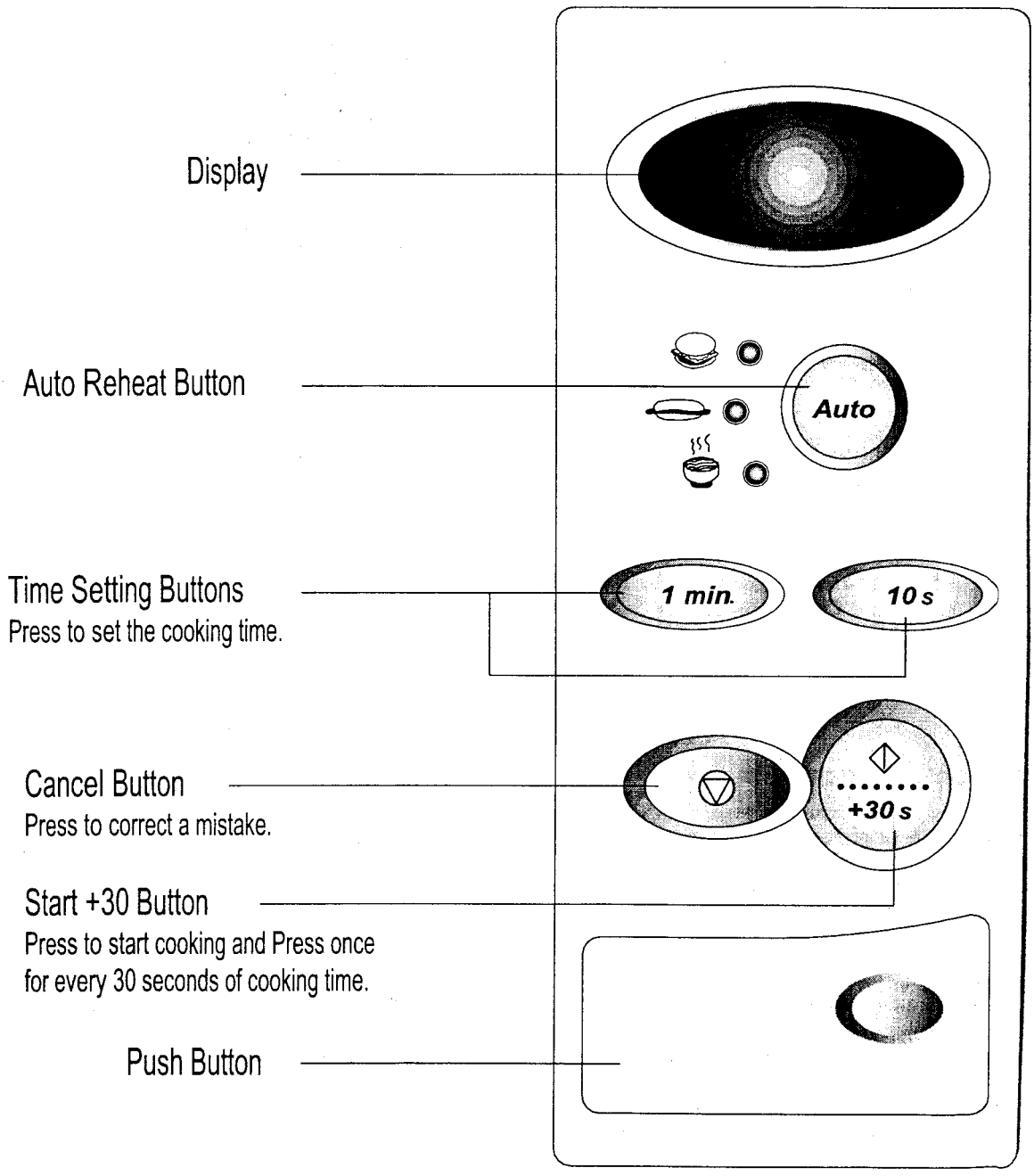


### Precaution

- Remove the glass tray from the oven before traveling to avoid damage.
- Operating the oven in a moving vehicle is not recommended.

# 3. Your New Microwave Oven (Continued)

## 3-2. Control Panel Buttons



# 4. Operation

## Setting Cooking Times

This oven is preset at the factory for automatic operation.

1. Once connected to the power supply the display on your oven will show : 8888.
2. Open the door. The oven light will turn on.
3. Put the food into a suitable container, place it in the center of the oven and then close the door securely. The oven light will go off.
4. Set the desired heating time by pressing the "1min." or "10s"button.
5. Press the start +30 s button:
   The oven light and cooling fan will come on. Heating will start. The time on the digital display will count down.
6. When time has elapsed, the Beep Tone will sound 3 times and all heating will stop. The oven light will go off.
7. Open the door and take the food out.
8. Close the door. The oven light will go off.

**NOTE**

- The oven light and all numbers in the display automatically turn of f after 5 minutes to conserve battery power
- Setting time cannot exceed maximum 30 minutes.

## Important Remark

Voltage supply of the microwave oven is limited to protect the safety of product and vehicle

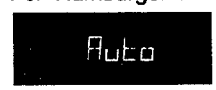
1. If the battery voltage goes below 21V when operating the oven or 21.5V when the oven is idle, the oven beeps 6 times and "Lo" blinks on the display.
2. If the battery voltage is low, you can check to see if it has returned to normal by pressing the Cancel button. If a blinking period (.) appears, the voltage has returned to normal and you can use the oven again.
3. If the battery voltage goes above 28.5V when operating the oven or 29.5V when the oven is idle, the oven beeps 6 times and "HI" blinks on the display.
4. If the battery voltage is high, you can check to see if it has returned to normal by pressing the Cancel button. If a blinking period (.) appears, the voltage has returned to normal and you can use the oven again.

## Reheating Automatically

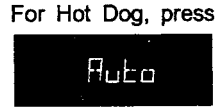
To reheat food, select the type of snack and the microwave automatically sets the reheating time.

1. Press the Auto button repeatedly to select the type of Snack you wish to reheat. The initial serving size for each dish is one serving.

For Hamburger Reheat, press 1 time.




For Hot Dog, press 2 times.




For Instant Noodle Soup, press 3 times.

Only one serving is available for Hamburger Reheat, Hot Dog and Instant Noodle Soup.

2. Press the Start +30s button. The display will show Cooking time.

## Auto Chart

| Icon/Food | Serving Size/ Standing Time | Recommendations |
|---|---|---|
| Hamburger (chilled) | 150g/ 1-2 | Take one chilled hamburger(+6℃) out of the wrapping and place it on a piece of kitchen paper in the centre of the turntable. |
| Hot Dog (chilled) | 100g/ 1-2 | Take one chilled hot dog (+6℃) out of the wrapping and place it on a piece of kitchen paper in the centre the turntable. |
| Instant Noodle Soup(room temperature) | 250g/ 2-3 | Use a plastic bowl or cup of ready product, check if microwave able. Pour 200ml water (+20℃) on top of the instant noodles (50g). Stir once or twice during standing time. |

# 4. Operation (Continued)

## Using the Start +30 s Button

This is a ONE TOUCH COOK pad.
By touching the pad once, you can start heating instantly for 30 seconds.

You can increase the cooking time by pressing the Start +30 s Button during heating.

Cooking time increases by 30 seconds Button with each press of the Start +30 s Button, but it can not exceed the maximum time of 30 minutes.

Like traditional cooking, you may find that you have to adjust the cooking times slightly. You can:

- Check how cooking is progressing at any time simply by opening the door.
- After checking, close the door.
- Increase the remaining cooking time if necessary. Before operating the oven, times can be increased using either the time pads or Start +30 s Button. During operation, time may only be added by using the Start +30 s Button.

## Using the Cancel (▽) Button

- To stop cooking, erase instructions, and return the oven display to period(.): press Cancel (▽) Button.

- To correct a mistake you have just entered: press Cancel (▽)once, then r e-enter the instructions.

## Error Codes

| Error Items | Code | Error Beep | Cause/Remedy |
|---|---|---|---|
| Low Voltage | | Beep 6 times | Low Batt. Voltage/ Check the Batt(Min.21.5V) |
| High Voltage | | | High Batt. Voltage/ Check the Batt(Max.29.5V) |
| No Acknowledge | | | EEPROM(internal memory IC)error/ Call service center |
| Check-sum Error | | | |
| No current | | | No current or over current.<br>Press the **Cancel** (▽) button.<br>Press the **Start(◇)+30s** button after setting up cooking time.<br>Call Service Center (Displaying three times continuous "nC" or "oL"). |
| Over current | | | |

# 5. Disassembly and Reassembly

## 5-1. Replacement of Magnetron, Motor Assembly and Lamp

Remove the magnetron including the shield case, permanent magnet, choke coils and capacitors (all of which are contained in one assembly).

1. Disconnect all lead wires from the magnetron and lamp.
2. Remove the cover blower.
3. Remove the air cover.
4. Remove screws securing the magnetron to the wave guide.
5. Take out the magnetron very carefully.
6. Remove screws from the back panel.
7. Take out the fan motor.
8. Remove the oven lamp by pulling out from hole of air cover carefully.

**NOTE1**: When removing the magnetron, make sure that its antenna does not hit any adjacent parts, or it may be damaged.

**NOTE2**: When replacing the magnetron, be sure to remount the magnetron gasket in the correct position and make sure the gasket is in good condition.

# 5. Disassembly and Reassembly (continued)

## 5-2. Reassembly

After replacement of the defective component parts of the door, reassemble it and follow the instructions below for proper installation and adjustment so as to prevent an excessive microwave leakage.

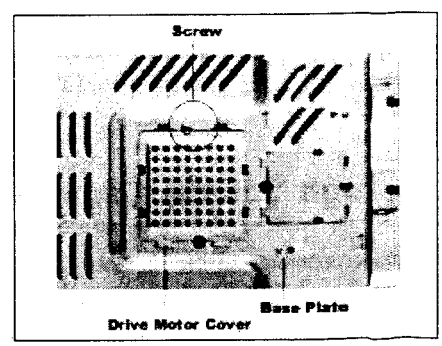
1. When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge and lower hinge in the direction necessary for proper alignment.
2. Adjust so that the door has no play between the inner door surface and oven front surface. If the door assembly is not mounted properly, microwave energy may leak from the space between the door and oven.
3. Do the microwave leakage test.

## 5-3. Replacement of Fuse

1. Disconnect the oven from the power source.
2. When fuse blows out by the operation of interlock monitor switch failure, replace the primary interlock switch, door sensing switch, monitor switches and power relay.
3. When the above three switches operate properly, check if any other part such as Inverter P.C.B(80A), blower motor or Sub P.C.B(5A) is defective.

## 5-4. Replacement of Drive Motor

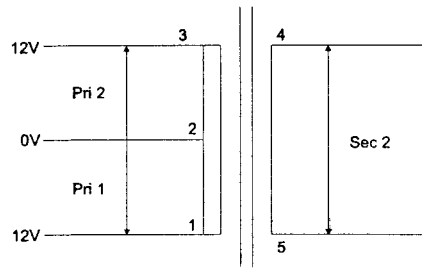
1. Take out the glass tray and guide roller from the cavity.
2. Turn the oven upside down to replace the drive motor.
3. Remove a screw securing the drive motor cover.
4. Disconnect all the lead wires from the drive motor.
5. Remove screws securing the drive motor to the cavity.
6. Remove the drive motor and coupler.
7. When replacing the drive motor, be sure to remount it in the cor-rect position with the coupler.
8. Connect all the leads to the drive motor.
9. Screw the drive motor cover to the base plate with a screw driver.



# 6. Alignment and Adjustments

## 6-1 Low Voltage Transformer

1. The low voltage transformer is located on the control circuit board.
2. Remove the low voltage transformer from the PCB Ass'y and check continuity.
3. Normal resistor reading is shown in the table.

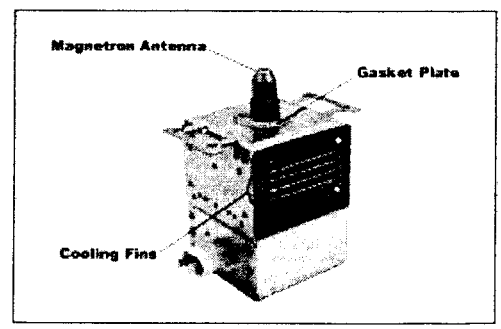



| Terminals | Resistance |
|---|---|
| | SLV-4300B |
| 1-2(Input) | 14.0Ω |
| 2-3(Input) | 16.0Ω |
| 3-4(Input) | 10.0Ω |

(Room emperature = 20℃)

## 6-2. Magnetron

1. Continuity checks can indicate only an open filament or a shorted magnetron. To diagnose an open filament or shorted magnetron:
2. Isolate the magnetron from the circuit by disconnecting its leads.
3. A continuity check across the magnetron filament termi-nals should indicate one ohm or less.
4. A continuity check between each filament terminal and magnetron case should read open.




## 6-3. High Voltage Capacitor and High Voltage Surge-absorber Capacitor.

1. Check continuity of the capacitor with the meter ser at the highest resistance scale.
2. Once the capacitor is charged, a normal capacitor shows continuity for a short time, and then indicates ∞Ω.
3. A shorted capacitor will show continuous continuity.
4. An open capacitor will show constant ∞Ω.
5. Resistance between each terminal and chassis should read infinite.

# 6. Alignment and Adjustments (continued)

## 6-4. High Voltage Diode

1. Isolate the diode from the Inverter-P.C.B by disconnecting its leads.

2. With the ohm-meter set at the highest resistance scale, measure across the diode terminals. Reverse the meter leads and read the resistance. A meter with 6V, 9V or higher voltage batteries should be used to check the front-to back resistance of the diode (otherwise an infinite resistance may be read in both directions). The resistance of a normal diode will be infinite in one direction and serveral hundred Kin the other direction.

## 6-5. Power Control Relay, Lamp Relay and Fan Motor Relay

1. The relays are located on the PCB Ass'y. Isolate them from the main circuit by disconnecting the leads.
2. Operate the microwave oven with a water load in the oven.
3. Check continuity between terminals of the relays after the start pad is pressed.

## 6-6. Adjustment of Primary Switch, Door Sensing Switch Monitor Switch

**PRECAUTION**

For continued protection against radiation hazard, replace parts in accordance with the wiring diagram and be sure to use the correct part number for the following switches: Primary interlock and secondary interlock(door sensing), and the monitor switch (replace all together). Then follow the adjustment procedures below. After repair and adjustment, be sure to check the continuity of all interlock switches and the monitor switch.

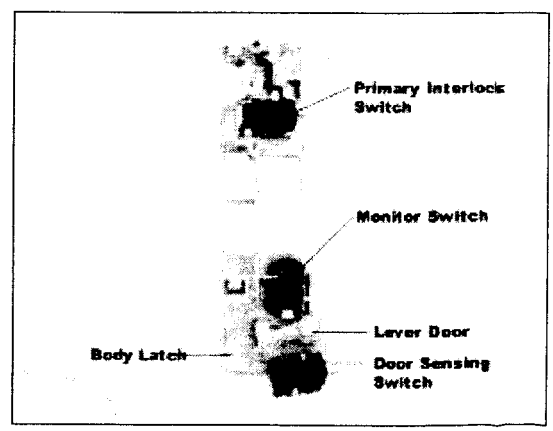
1. When mounting Primary switch and Monitor switch to Latch Body, consult the figure.

2. No specific adjustment during installation of Primary switch and Monitor switch to the latch body is necessary.

3. When mounting the Latch Body to the oven assembly, adjust the Latch Body by moving it so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is holding the Latch Body to the oven assembly.

4. Reconnect to Monitor switch and check the continuity of the monitor circuit and all latch switches again by following the components test procedures.

5. Confirm that the gap between the switch housing and the switch actuator is no more than 0.5 mm when door is closed.




| | Door Open | Door Closed |
|---|---|---|
| Primary switch | ∞ | 0 |
| Monitor switch(COM-NC) | 0 | ∞ |
| Door Sensing S/W | ∞ | 0 |

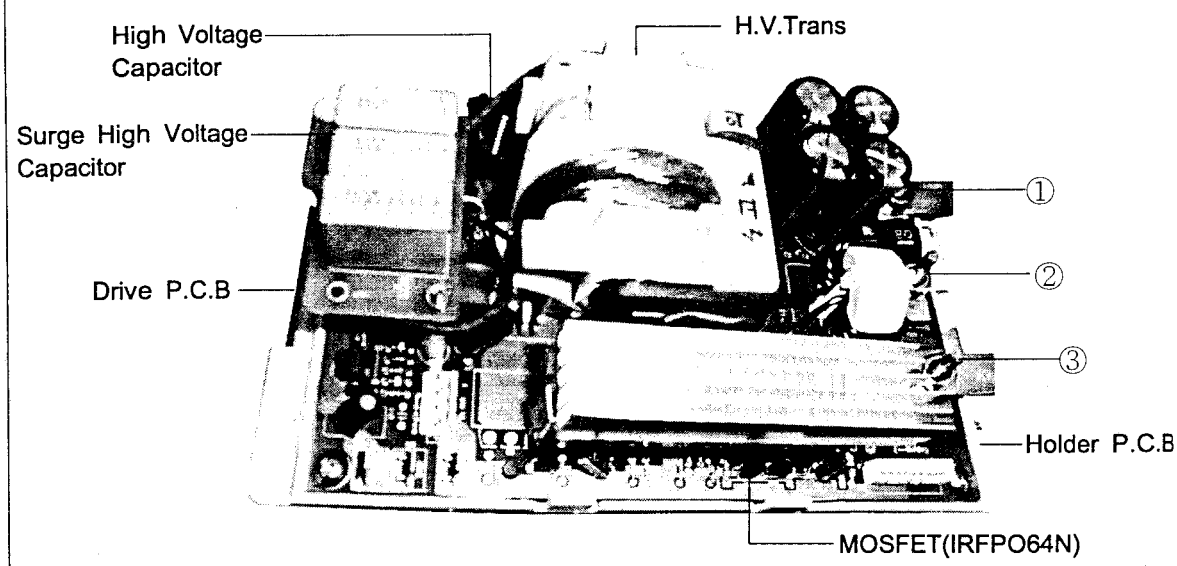
# 7. Troubleshooting

**PRECAUTION**

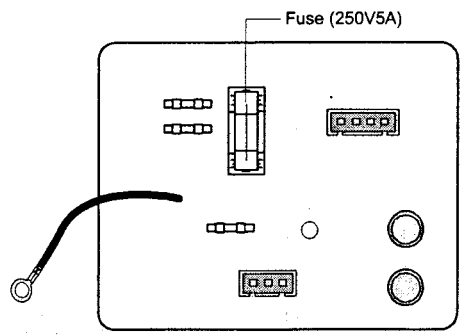
1. Check ground before checking for trouble.
2. Be careful of the high voltage circuit
3. Discharge the high voltage capacitor.
4. When checking the continuity of the switches or transformer, disconnect lead wires from these parts and then check continuity without the power source on. To do otherwise may result in a false reading or damage to your meter.
5. Do not touch any part of the circuit or the control circuit board, since static discharge may damage it. Always Touch ground while working on it to discharge any static charge built up.

## 7-1. Cross Section (Ass'y Inverter P.C.B and Drive P.C.B)

Ass'y-Inverter P.C.B




Ass'y-Sub P.C.B




**Note** : Changing ①~③ requires to follow minimum torque range 40 kg.cm

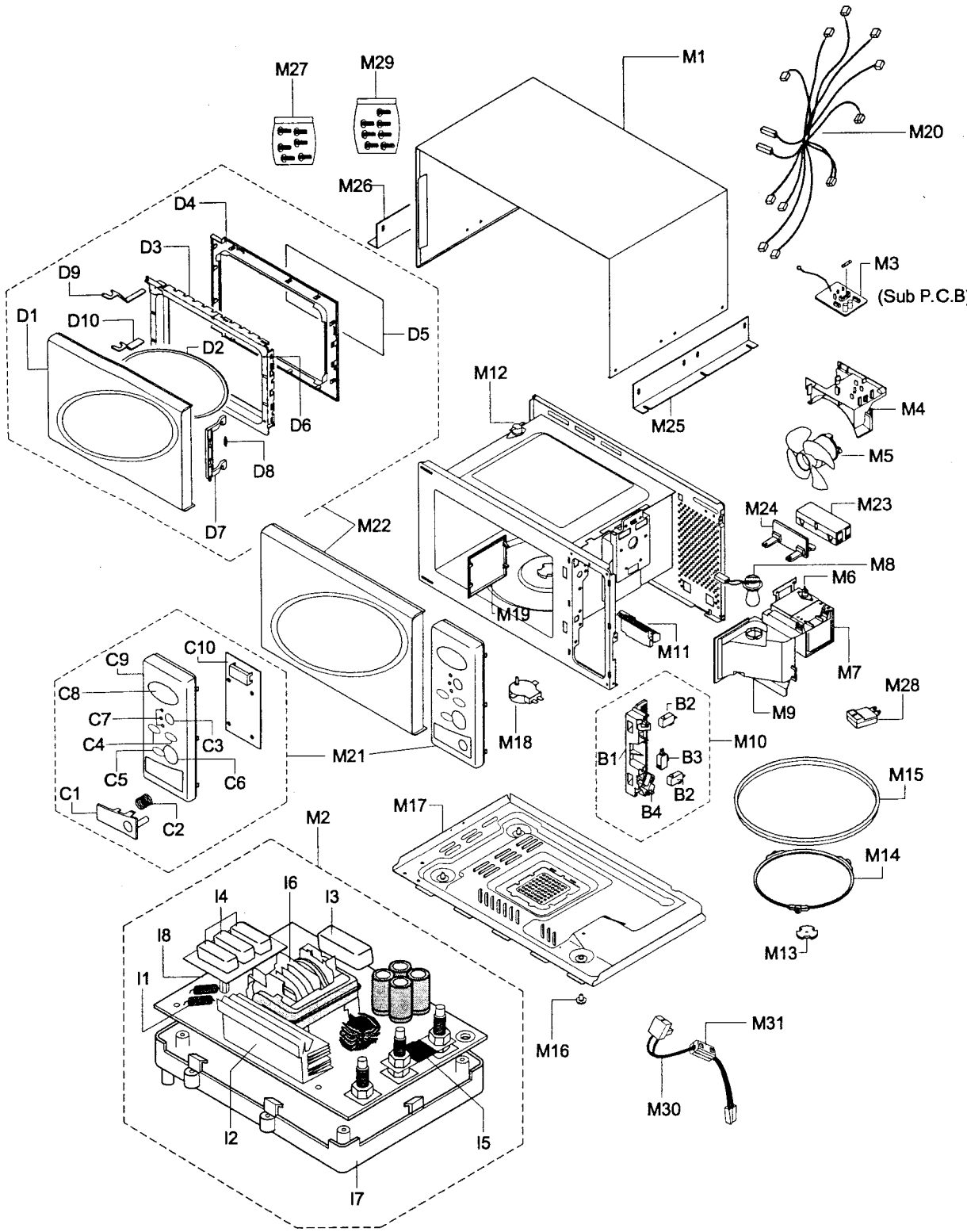
# 7. Troubleshooting (Continued)

## 7-2 Electrical Malfunction

| SYMPTOM | CAUSE | CORRECTIONS |
|---|---|---|
| Oven is dead<br>Main Fuse is OK.<br>No display and no operation | 1. Open or loose lead wire harness<br>2. Open thermal cutout switch<br>(magnetron, cavity)<br>3. Open fuse(5A)<br>4. Defective Ass'y inverter P.C.B | Check wire harness<br>Check magnetron or cavity thermal<br>cutout switch is defective.<br>Check Ass'y Sub P.C.B<br>Replace Ass'y inverter P.C.B |
| No display and no operation<br>Main Fuse blown out | 1. Short MOSFET<br>2. Mismatch +, - polarity battery power cable<br>3. Defective monitor switch<br>4. Shorted battery power cable<br>5. Shorted High voltage components (NOTE 2) | Replace Ass'y Inverter P.C.B<br>Replace Main Fuse<br>Check adjustment of primary,<br>monitor, door sensing switch<br>Check battery power cable<br>Replace Ass'y inverter P.C.B |
| | NOTE 1 : Check continuity power relay contact and if it has not continuity,<br>replace power relay also.<br>NOTE 2 : When Ass'y Inverter P.C.B is replaced, check magnetron also. | |
| Oven does not accept key<br>input | 1. Shorted or open tact switch.<br>2. Defective secondary latch switch (NOTE 1)<br>3. Defective Ass'y P.C.B | <br><br>Replace P.C.B main |
| Timer Starts countdown but<br>no microwave oscillation.<br>(No heat while oven lamp<br>and fan motor turn on) | 1. Defective high voltage components<br>2. Defective primary latch switch<br>3. Open wire harness or terminal | Check high voltage component<br>according to component test<br>procedure and replace Ass'y<br>inverter P.C.B if defective<br>Check adjustment of primary switch<br>Reconnect |
| "nC"message | 1. Open wire harness or terminal<br>2. Defective Ass'y inverter P.C.B | Reconnect<br>Replace Ass'y inverter P.C.B |
| "oC"message | 1. Shorted high voltage component | Check high voltage components<br>according to component test<br>procedure and replace Ass'y<br>inverter P.C.B if defective |
| "nA","CE"message | 1. Defective P.C.B main | Check EEPROM and replace P.C.B<br>main if defective |

# 8. Exploded Views and Parts List

## 8-1 Exploded Views



# 8. Exploded Views and Parts List (Continued)

## 8-2 Main Parts List

| No. | Code No. | Description | Specification | Q'ty | Remark |
|---|---|---|---|---|---|
| M1 | DE70-00115L | PANEL-OUTER | -,T0.5,-,-,P-WHT,MD4300,AC/DC | 1 | |
| M2 | DE92-00772A | ASSY PCB INVERTER | DE7712N,DC24V30KHz | 1 | |
| M3 | DE92-00777A | ASSY PCB-SUB | DC12V/24V,DE7711N/DE7712N | 1 | |
| M4 | DE71-60467A | COVER-BLOWER | PP,3RD,0.7 | 1 | |
| M5 | DE31-00017A | MOTOR-DC | A1238H24D-SS,2650rpm,-,-,-,-,- | 1 | |
| M6 | DE47-20009A | THERMOSTAT | PW2N-520PB,160/60,250V/7.5A,H, | 1 | MGT |
| M7 | OM52S(31)ESS | ASSY-MAGNETRON | OM52SH(31)ESS | 1 | |
| M8 | 4713-001149 | LAMP-INCANDESCENT | 24V,-,21W,-,460Lm,-,26.5x50mm | 1 | |
| M9 | DE71-00050A | COVER-AIR | PP,T2,-,-,WHT,DA7311,ACDC | 1 | |
| M10 | DE93-20001A | ASSY BODY LATCH | 2ND-W1,M97G45/M9745,-,-,- | 1 | |
| M11 | DE66-90013A | LEVER-DOOR | POM(F20-01),NTR,MW5630T,-,-,-, | 1 | |
| M12 | DE47-20008A | THERMOSTAT | PW-2N,100/60,7.5A | 1 | |
| M13 | DE67-60075A | COUPLER | PPS,7G,BRN,M97G45,-,-,-,- | 1 | |
| M14 | DE92-90436D | ASSY-GUIDE ROLLER | JE740,SPS(C832-V0),XAREC,-,-,- | 1 | |
| M15 | DE74-20102B | TRAY-COOKING | GLASS,T5.0,PI288,780G,M745,-,- | 1 | |
| M16 | DE61-40066A | FOOT | PP,BLK,-,-,3RD-W,- | 4 | BASE PLEAT |
| M17 | DE80-00008A | BASE-PLATE | SGCC1-Z,T0.8,-,-,DA7311,ACDC,- | 1 | |
| M18 | DE31-10154A | MOTOR-SYNCHRONOUS | M2HJ49ZR02,ST-16,50/60HZ,- | 1 | |
| M19 | DE71-60450B | COVER-MGT | PP,T2,W110.5,L109,-,28G,3RD-0.7 | 1 | |
| M20 | DE39-00282A | WIRE HARNESS-DCN | DE7711N/DE7712N,12/24V,30KHz | 1 | |
| M21 | DE94-00345C | ASSY CONTROL-BOX | TACT TYPE,DE7712N/DC-MWO,WHT | 1 | S.N.A |
| M22 | DE94-00260C | ASSY DOOR | DE7711,DE7712/XEG,PURE-WHT,ABS0370D | 1 | |
| M23 | DE71-00088A | COVER-CONNECTOR POWER | PP(5102FR0),T2.5,-,-,-,MD4300,ACDC | 1 | |
| M24 | DE97-00131A | ASSY-POWER CONECTOR | DA7311/MD4300,ACDC,0.7CUFT,-,-,- | 1 | |
| M25 | DE61-00093B | BRACKET-RIGHT | SECC ,T1.6,-,-,WHT,MD4300,- | 1 | O-PANEL |
| M26 | DE61-00094B | BRACKET-LEFT | SECC,T1.6,-,-,WHT,MD4300,- | 1 | O-PANEL |
| M27 | DE69-00169A | BAG-SCREW PACKING | MD4301G/DE7711,BAG+SCREW5*25 | 1 | |
| M28 | DE27-10020A | COIL-MC CHOKE | TC,101,-,-,-,-,- | 1 | |
| M29 | DE97-00188A | ASSY-PACKING SCREW | DE7711,BAG+WHT | 1 | |
| M30 | DE39-00283A | WIRE HARNESS-H | DE7711N/DE7712N,12/24V,30KHz | 1 | |
| M31 | DE73-90027A | FERRITE-CORE | NI-ZN,T13.8,W21.0,L28.0,BNF-14 | 1 | |

# 8. Exploded Views and Parts List (Continued)

## 8-3 Door Parts List

| No. | Code No. | Description | Specification | Q'ty | Remark |
|---|---|---|---|---|---|
| D1 | DE64-00072C | DOOR-A | DE7711,7712/XEG,ABS(HR0370D),-,PURE-WHT,-,-,- | 1 | |
| D2 | DE67-00022A | SCREEN-DOOR | DA7311,SAN(CR5381G0150),T2,-,-,SMOG,-,- | 1 | |
| D3 | DE92-50133G | ASSY DOOR-E | MD4300,BLK-COATING,ACDC | 1 | |
| D4 | DE64-40008B | DOOR-C | PP,T1.5,BLK,CE745G,-,-,- | 1 | |
| D5 | DE01-00112A | FILM-DOOR | PET,T0.15,W150,L268,NTR,3RD-W | 1 | |
| D6 | DE60-00018A | SPACER-DOOR | MD4300,TEFRON+NITT02000,-,-,-,WHT,T0.8+0.15,-,- | 2 | |
| D7 | DE64-40006F | DOOR-KEY | POM(F20-02),-,-,12G,BLK,MW7897G,NO-TALK | 1 | |
| D8 | DE61-00132A | SPRING-KEY | M1733,HSWR,D6,-,-,18 1/4,-,T0.6,-,-,NEW | 1 | |
| D9 | DE61-80004A | HINGE-LOWER | SCP1,T2.3,ZN-COATING,M745,-,-, | 1 | |
| D10 | DE61-80005A | HINGE-UPPER | SCP1,T2.3,ZN-COATIN,M745,-,-,- | 1 | |

## 8-4 Control Parts List

| No. | Code No. | Description | Specification | Q'ty | Remark |
|---|---|---|---|---|---|
| C1 | DE66-00069C | BUTTON-PUSH | DE7711,ABS(HR0370),-,PURE-WHT,- | 1 | |
| C2 | DE61-70076A | SPRING-BUTTON | HSWR,PI0.6,-,-,-,-,- | 1 | |
| C3 | DE67-00067B | BUTTON-SELECT(A) | ABS(HR0370D),-,PURE-WHT,DE7711,-,ACDC | 1 | |
| C4 | DE67-00068B | BUTTON-SELECT(B) | ABS(HR0370D),-,PURE-WHT,DE7711,-,ACDC | 1 | |
| C5 | DE67-00070C | BUTTON-CANCEL | ABS(HR0370D),-,WHT+GRN SPRAY,DE7711/12,- | 1 | |
| C6 | DE67-00069C | BUTTON-START | ABS(HR0370D),-,WHT+ORG SPRAY,DE7711/12,- | 1 | |
| C7 | DE67-00071A | BUTTON-LED PERMITE | ACRYL,-,D-GRY,DA7711,-,ACDC | 3 | C-PANEL |
| C8 | DE64-00135A | WINDOW-DISPLAY | SAN(CR5381G0126),SMOG,DA7711,- | 1 | |
| C9 | DE72-00098D | CONTROL-PANEL | ABS(HR0370D),DE7712N,T2.5,PURE-WHT,24V/EUROPE | 1 | |
| C10 | RC-DE7712N-00 | ASSY PCB PARTS:DE7712N | | 1 | |

## 8-5 Body Latch Parts List

| No. | Code No. | Description | Specification | Q'ty | Remark |
|---|---|---|---|---|---|
| B1 | DE66-40001A | LATCH-BODY | POM(F20-02),40GR,NTR,-,-,- | 1 | |
| B2 | 3405-000178 | SWITCH-MICRO | 250V,15A,200gf,SPST-NO | 2 | |
| B3 | 3405-000175 | SWITCH-MICRO | 250V,15A,200gf,SPST-NO | 1 | |
| B4 | DE66-90001A | LEVER-SWITCH | P.O.M(F20-02),2,6,NTR,2ND-W-P/ | 1 | |

# 8. Exploded Views and Parts List (Continued)

## 8-6 Power Connector Parts List

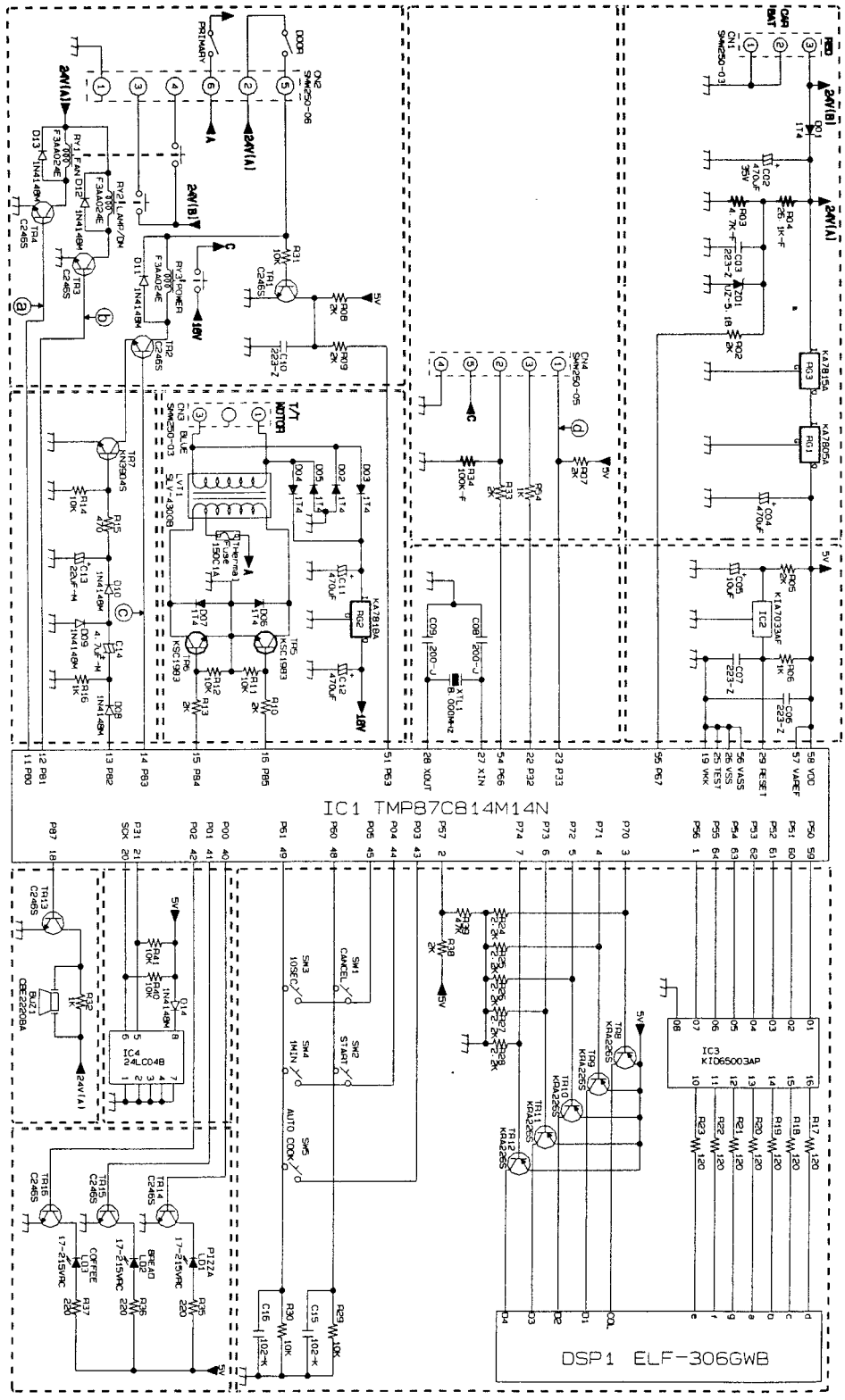
| No. | Code No. | Description | Specification | Q'ty | Remark |
|---|---|---|---|---|---|
| P1 | DE37-00001A | CONNECTOR-POWER | BSS T1.5+PBT,MD4300,-,-,-,-,-,-,-,- | 1 | |
| P2 | DE61-00084A | BRACKET-CONNECTOR-A | BSS,T1.5,-,-,YEL,DA7311,ACDC,- | 2 | |
| P3 | DE61-00085A | BRACKET-CONNECTOR-B | BSS,T1.5,-,-,YEL,DA7311,ACDC,- | 2 | |
| P4 | DE60-20063A | BOLT-FLANGE | M4,10,ZPC3,YEL,MSWR,-,-,-,- | 4 | |

## 8-7 Screw Parts List

| Code No. | Description | Specification | Q'ty | Remark |
|---|---|---|---|---|
| 6006-001081 | SCREW-ASS'Y TAPT | ET,TH,+,M4,L10,WHT,SWRCH18A | 1 | O-PANEL |
| 6006-001087 | SCREW-ASS'Y TAPP | ET,TH,+,M4,L20,SILVER,STS304 | 2 | INVERTER-PCB |
| 6021-001037 | NUT-HEXAGON | 2C,M5,NI PLT,BRASS | 2 | INVERTER-PCB |
| 6031-001167 | WASHER-E.T | STS304,M5,ID5.3,OD10.0,T0.6,PASS | 2 | INVERTER-PCB |
| DC60-20054F | SCREW TAPPING | TH,+,1,D4,L14,FE,FZY | 1 | C-BLOWER |
| DE60-10012A | SCREW-TAP TITE | TH,+,3,M4,L10,SWR10,ZPC2,TOOTH | 4 | base-plate |
| DE60-10012A | SCREW-TAP TITE | TH,+,3,M4,L10,SWR10,ZPC2,TOOTH | 1 | cov-air |
| DE60-10012A | SCREW-TAP TITE | TH,+,3,M4,L10,SWR10,ZPC2,TOOTH | 2 | po-connec |
| DE60-20054F | SCREW-TAPPING | TH,+,1,D4,L14,FE,FZY | 4 | INVERTER-HOLDER |
| DE60-10080B | SCREW-WASHER | PH,PI5,L10,SWRCH18A,ZP2,2S,-,- | 4 | MGT |
| DE60-10082H | SCREW-A | 2S-4X12,TOOTHED,-,-,-,-,-,-,-, | 1 | CORD CLAMP |
| DE60-10082H | SCREW-A | 2S-4X12,TOOTHED,-,-,-,-,-,-,-, | 2 | bkt-motor |
| DE60-10082H | SCREW-A | 2S-4X12,TOOTHED,-,-,-,-,-,-,-, | 2 | body-lat |
| DE60-10082H | SCREW-A | 2S-4X12,TOOTHED,-,-,-,-,-,-,-, | 2 | con-box |
| DE60-10098A | SCREW-ASSY TAP TITE | PH,TC,M4X8,SWRCH18A,ZPC2,GLD,W | 1 | CAV-TCO |
| DE60-10098A | SCREW-ASSY TAP TITE | PH,TC,M4X8,SWRCH18A,ZPC2,GLD,W | 2 | GEAR-MTR |
| DE60-10098A | SCREW-ASSY TAP TITE | PH,TC,M4X8,SWRCH18A,ZPC2,GLD,W | 1 | MEMB-GRD |
| DE60-10098A | SCREW-ASSY TAP TITE | PH,TC,M4X8,SWRCH18A,ZPC2,GLD,W | 2 | MGT-TCO |
| DE60-10195A | SCREW-STAR POLE | TH,*,2,4,12,SWCH18A,ZNC,-,-,- | 4 | |
| DE60-20063A | BOLT-FLANGE | M4,10,ZPC3,YEL,MSWR,-,-,-,- | 2 | HI-LOW |
| DE60-20063A | BOLT-FLANGE | M4,10,ZPC3,YEL,MSWR,-,-,-,- | 2 | HI-UPP |
| DE60-30016B | NUT-FLANGE | M4,MSWR10,FEFN,-,-,-,-,-,- | 2 | CAVITY |
| DE60-10088A | SCREW-TAP PH | PH,M3,L8,FEFZY,PLAIN,-,-,-,-,- | 7 | PCB |
| DE60-10055A | SCREW-TAP TITE | PH,M4,L8,FEFZY,-,-,-,-,-,- | 2 | |
| DE60-10195A | SCREW-STAR POLE | TH,*,2,4,12,SWCH18A,ZNC,-,-,- | 2 | base-cover |
| DE60-10082H | SCREW-A | 2S-4X12,TOOTHED,-,-,-,-,-,-,-, | 1 | |
| DE60-10088A | SCREW-TAP PH | PH,M3,L8,FEFZY,PLAIN,-,-,-,-,- | 1 | |

# 9. P.C.B Circuit Diagrams and Parts List

## 9-1. Main P.C.B Circuit Diagrams



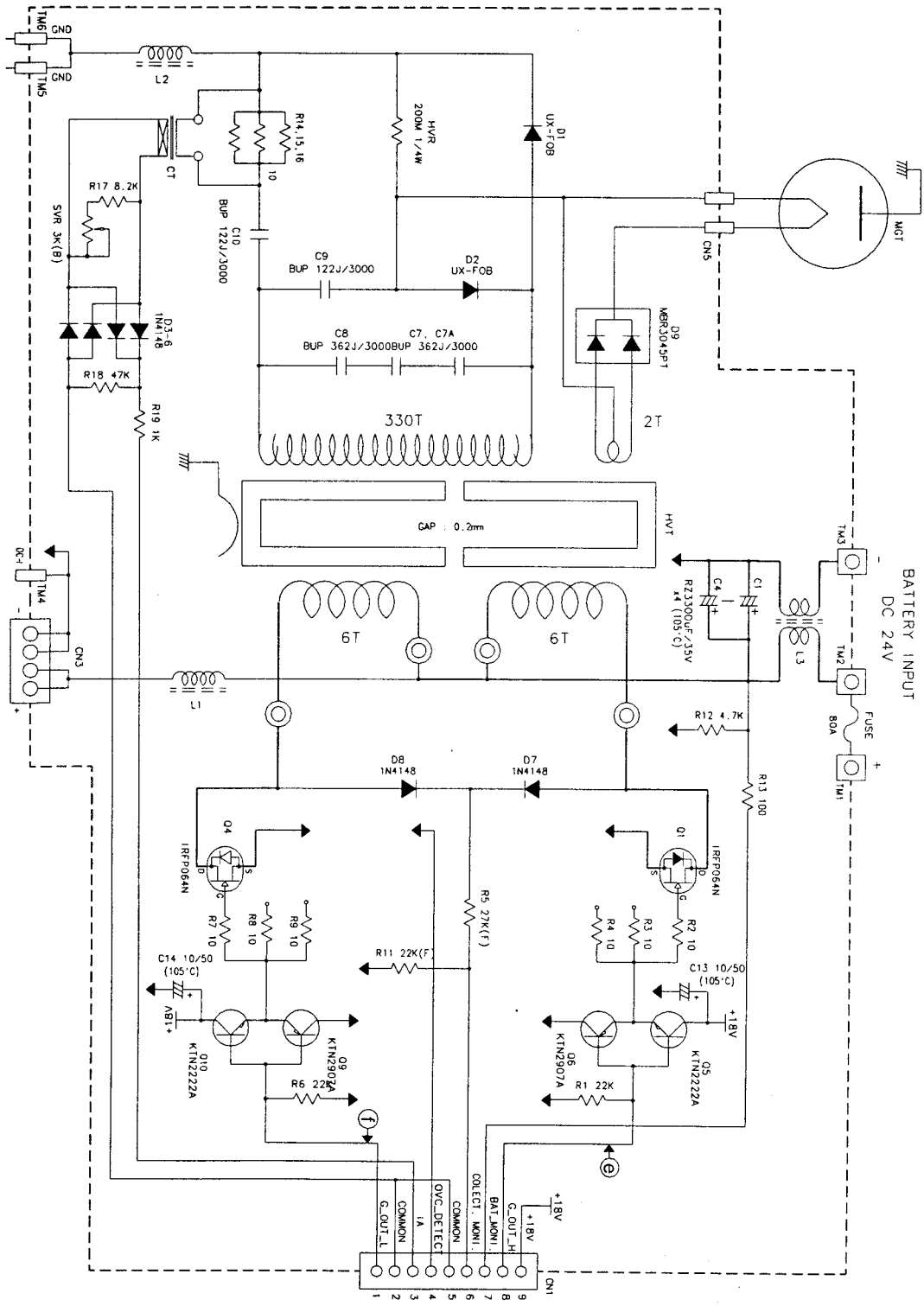
# 9. P.C.B Circuit Diagrams and Parts List (Continued)

## 9-2. Main P.C.B Parts List

| Code No. | Description | Specification | Q'ty | Remark |
|---|---|---|---|---|
| 0502-000258 | TR-POWER | KSC1983,NPN,30W,TO-220,-,500 | 2 | TR5,6 |
| 0506-000180 | TR-ARRAY | 2003,NPN,7,1150mW,DIP-16,ST,1000- | 1 | IC3 |
| 1203-000259 | IC-POSI.FIXED REG. | 7818,TO-220,3P,-,PLASTIC,17.3/ | 1 | RG2 |
| 3501-001155 | RELAY-MINIATURE | 24VDC,200MW,3000MA,1FORMA,10MS,10MS | 3 | RY1,2,3 |
| DE07-00019A | LED DISPLAY | CSQ-4242G-21(S),-,-,30seg,5digit,45.2*22.3*18.0,-,- | 1 | DSP1 |
| DE09-00108A | IC MICOM | TMP87PM14F,OTP-32K,QFP,8BIT-64PIN,-,-,-,- | 1 | IC1 |
| DE13-20014A | IC-VOLT REGU | KA7815,TO-220,-,-,-,-,- | 1 | RG3 |
| DE13-20016A | IC-VOLT REGU | KA7805A,TO-220AB,1A,0/125C,-,- | 1 | RG1 |
| DE26-00043A | TRANS-L.V | SLV-4300B,24V,57Hz,AC21V/0.2A,-,35*14,PIN,- | 1 | LVT1 |
| DE30-20016A | BUZZER | CBE2220BA,STICK,-,-,-,-,-,-,- | 1 | BUZ1 |
| DE92-00773A | ASSY PCB AUTO | 24V30KHZ,LED-DISPLAY,RC-DE7712N-00,-,- | 1 | |
| 0401-001083 | DIODE-SWITCHING | MM4148,100V,150MA,LL-34,TP | 7 | D08~14 |
| 0402-001103 | DIODE-RECTIFIER | 1T4,400V,1A,TS-1,TP | 7 | D01~07 |
| 0403-001288 | DIODE-ZENER | ZMM55C5V1,4.8-5.4V,500MW,LL-34,TP | 1 | ZD1 |
| 0501-000465 | TR-SMALL SIGNAL | MMBT3904,NPN,350mW,SOT-23,TP,100-300 | 1 | TR7 |
| 0504-001008 | TR-DIGITAL | RN2427,PNP,200MW,2.2K/10K,SOT-23,TP | 5 | TR8~12 |
| 0504-001080 | TR-DIGITAL | KRC246S,NPN,200mW,2.2K/10K,SOT-23,TP | 8 | TR1~4,13~16 |
| 0601-001467 | LED | CHIP,RED,1.4x1.25mm,640nm | 3 | LD1,2,3 |
| 1103-001020 | IC-EEPROM | N24C04-WBN6,2x256Kx8Bit,DIP,8P,300MIL,-,- | 1 | IC4 |
| 1202-000141 | IC-VOLTAGE COMP. | 7033,SOT-89,3P,-,SINGLE,0V,-,P | 1 | IC2 |
| 2007-000277 | R-CHIP | 100KOHM,1%,1/10W,DA,TP,2012 | 1 | R34 |
| 2007-000300 | R-CHIP | 10KOHM,5%,1/10W,DA,TP,2012 | 8 | R11,12,14,29~31,40,41 |
| 2007-000346 | R-CHIP | 120OHM,5%,1/8W,DA,TP,3216 | 7 | R17~23 |
| 2007-000468 | R-CHIP | 1KOHM,5%,1/10W,DA,TP,2012 | 4 | R06,16,32,54 |
| 2007-000496 | R-CHIP | 2.2KOHM,5%,1/8W,DA,TP,3216 | 5 | R24~28 |
| 2007-000575 | R-CHIP | 220OHM,5%,1/8W,DA,TP,3216 | 3 | R35,36,37 |
| 2007-000671 | R-CHIP | 2KOHM,5%,1/10W,DA,TP,2012 | 9 | R02,05,07~10,13,33,38 |
| 2007-000868 | R-CHIP | 4.7KOHM,1%,1/10W,DA,TP,2012 | 1 | R03 |
| 2007-000931 | R-CHIP | 470OHM,5%,1/10W,DA,TP,2012 | 1 | R15 |
| 2007-000941 | R-CHIP | 47KOHM,5%,1/10W,DA,TP,2012 | 1 | R39 |
| 2007-007219 | R-CHIP | 26.1KOHM,1%,1/10W,DA,TP,2012 | 1 | R04 |
| 2203-000444 | C-CERAMIC,CHIP | 1nF,10%,50V,X7R,TP,2012,- | 2 | C15,16 |
| 2203-000555 | C-CERAMIC,CHIP | 0.02nF,5%,50V,NP0,TP,2012 | 2 | C08,09 |
| 2203-001608 | C-CERAMIC,CHIP | 22nF,+80-20%,50V,Y5V,TP,2012 | 4 | C03,06,07,10 |
| 2401-000037 | C-AL | 470uF,20%,16V,GP,TP,8x11.5,5 | 1 | C04 |
| 2401-000466 | C-AL | 10uF,20%,35V,GP,TP,5x7,5 | 1 | C05 |
| 2401-000911 | C-AL | 22uF,20%,16V,GP,TP,5x7,5 | 1 | C13 |
| 2401-001415 | C-AL | 470uF,20%,35V,GP,TP,10x20,5 | 3 | C02,11,12 |
| 2401-002075 | C-AL | 4.7uF,20%,50V,GP,TP,5x11,5 | 1 | C14 |
| 2801-003933 | CRYSTAL-UNIT | 8MHz,50ppm,28-AAA,12pF,70ohm,TP | 1 | XTL1 |
| 3404-001129 | SWITCH-TACT | 12VDC,50mA,160gf,6.6x6.6x7mm,- | 5 | SW1~5 |
| 3711-000879 | CONNECTOR-HEADER | BOX,3P,1R,2.5mm,STRAIGHT,SN | 1 | CN3 |
| 3711-000880 | CONNECTOR-HEADER | BOX,3P,1R,2.5mm,STRAIGHT,SN | 1 | CN1 |
| 3711-000999 | CONNECTOR-HEADER | BOX,5P,1R,2.5mm,STRAIGHT,SN | 1 | CN4 |
| 3711-001038 | CONNECTOR-HEADER | BOX,6P,1R,2.5mm,STRAIGHT,SN | 1 | CN2 |
| DE39-60001A | WIRE-SO COPPER | PI0.6,SN,T,52MM,TAPING_WIRE,-, | 39 | J01~39 |
| DE41-00199A | PCB-MAIN | RC-DE7712N-**,FR-1,1,-,-,L197*W197*T1.6,-,- | 1 | |
| DE60-60012A | PIN-EYELET | ID2.1,OD2.5,L3.0,SN,BSP,T0.25, | 9 | |

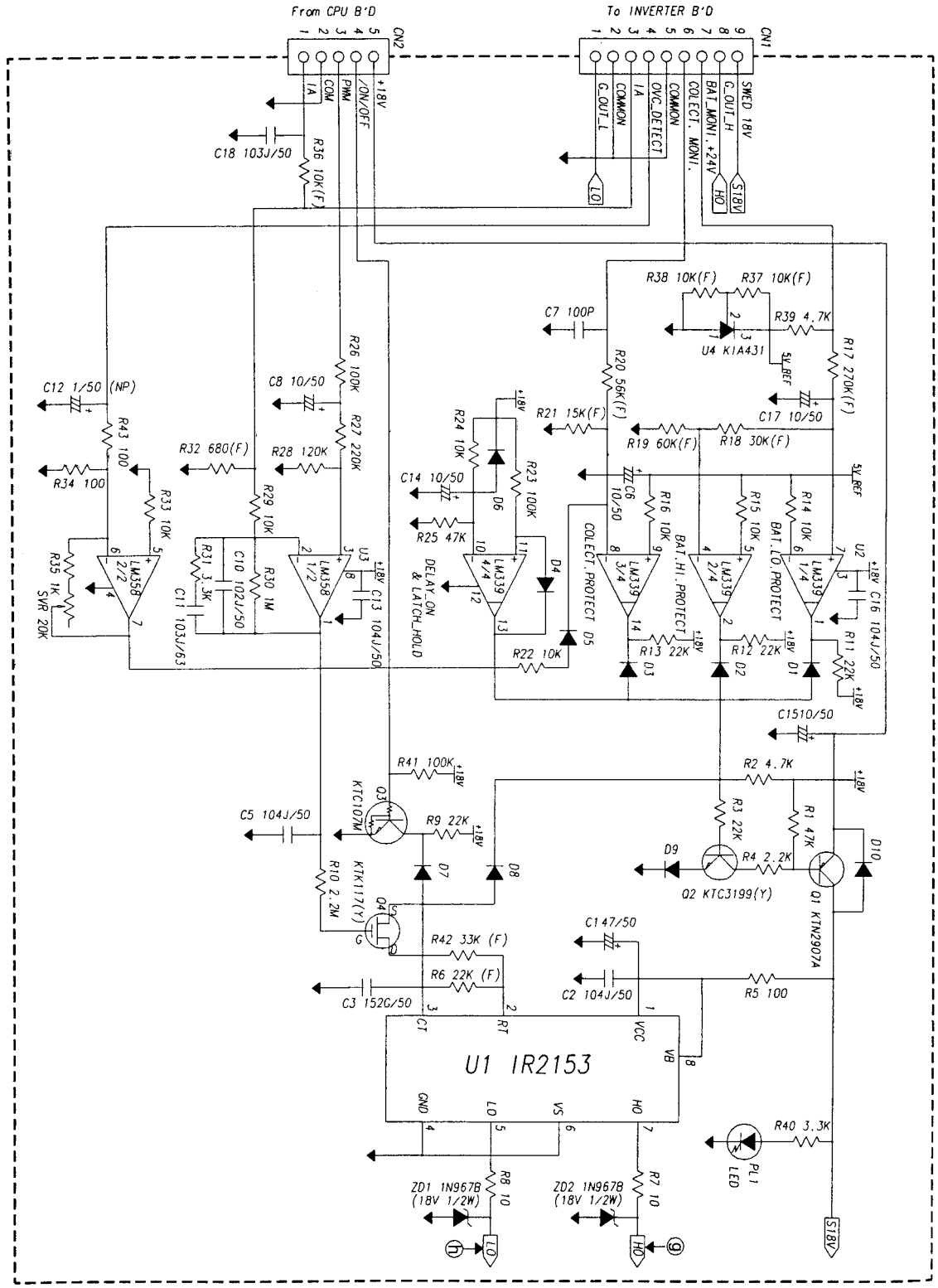
# 9. P.C.B Circuit Diagrams and Parts List (Continued)

## 9-3. Inverter P.C.B Circuit Diagram



# 9. P.C.B Circuit Diagrams and Parts List (Continued)

## 9-4. Drive P.C.B Circuit Diagram



# 9. P.C.B Circuit Diagrams and Parts List (Continued)

## 9-4. Sub P.C.B Parts List

| No. | Code No. | Description | Specification | Q'ty | Remark |
|---|---|---|---|---|---|
| I1 | 0402-001410 | DIODE-RECTIFIER | ESJC32-08XP,7.5KV,0.35A | 2 | |
| I2 | 0505-001552 | FET-SILICON | IRFP064N,55V,110A | 2 | |
| I3 | 2301-001483 | C-FILM,MPEF | 1.2NF,3KV | 2 | |
| I4 | 2301-001484 | C-FILM,MPEF | 3.6NF,3KV | 3 | |
| I5 | 3601-001220 | FUSE | 32VDC,80A,FAST-ACTING | 1 | |
| I6 | DE26-00065A | TRANS-H.V | SHV-DE7712N,24VDC | 1 | |
| I7 | DE61-00195A | HOLDER-PCB | DE7712N,PBT(VIB5050),WHT | 1 | |
| I8 | DE92-00785A | ASSY PCB-DRIVE | DE7712N,DC24V30KHz | 1 | |

## 9-5. Sub P.C.B Parts List

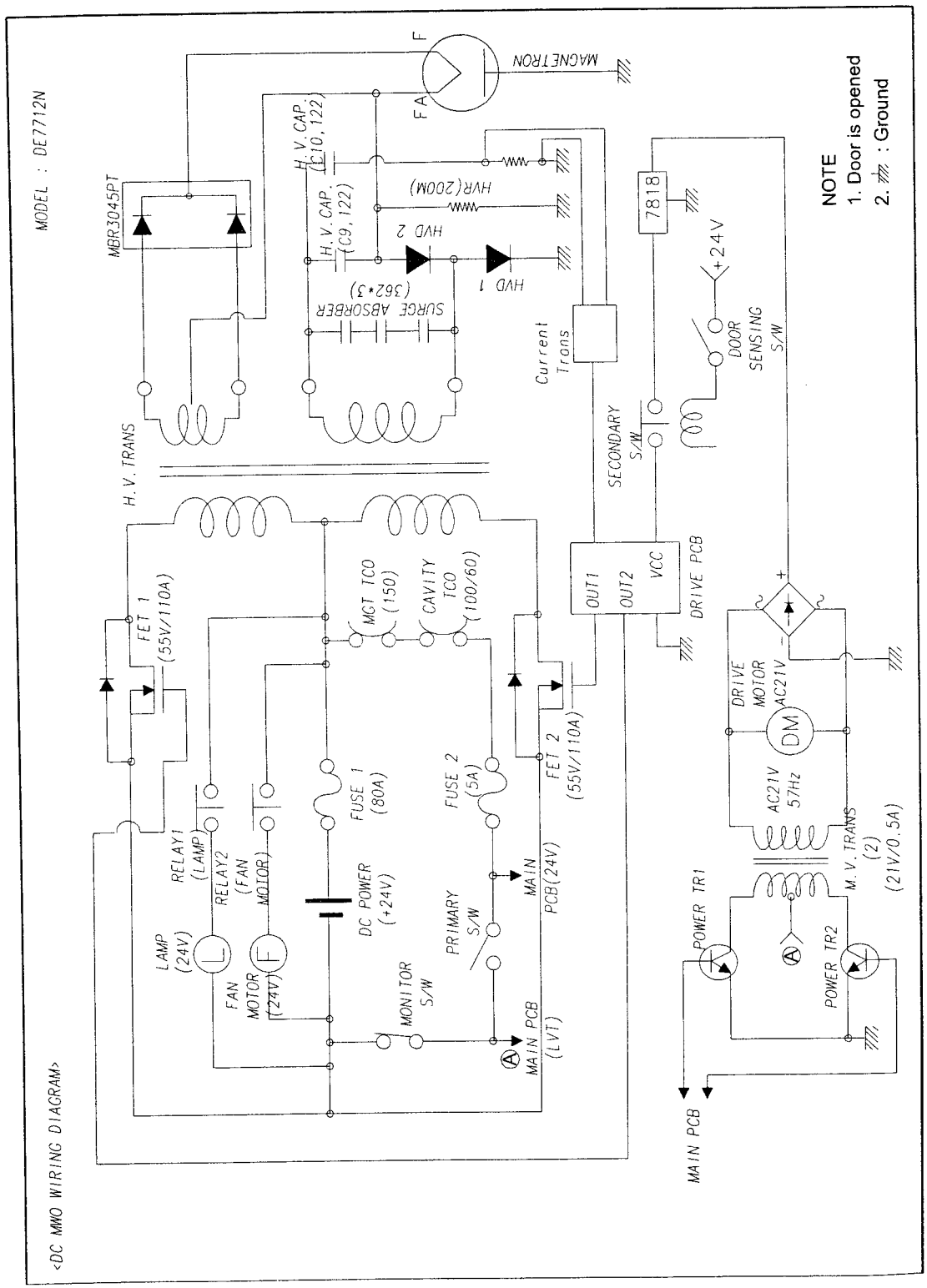
| Code No. | Description | Specification | Q'ty | Remark |
|---|---|---|---|---|
| 3601-001094 | FUSE-CARTRIDGE | 250V,5A,FAST-ACTING | 1 | |
| DE47-40024A | HOLDER-FUSE | FH-51H,7.5A | 1 | |

## 9-6. Drive P.C.B Parts List

| Code No. | Description | Specification | Q'ty | Remark |
|---|---|---|---|---|
| 1003-001394 | IC-GATE DRIVER | IR2153,DIP,8P,260MIL | 1 | |

# 10. Wiring Diagrams and Operating Sequence

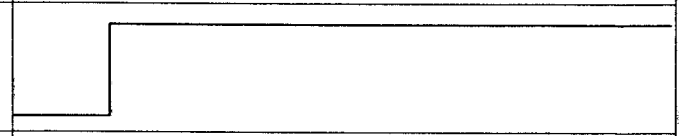
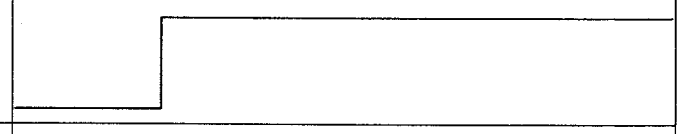
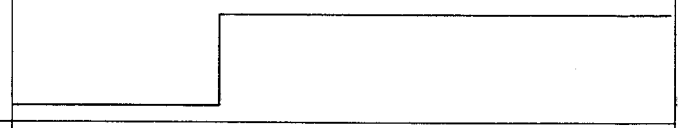
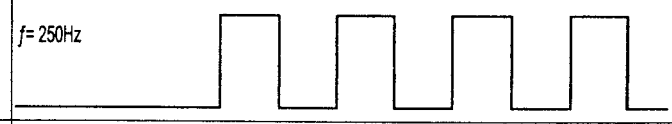
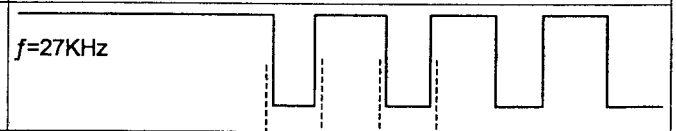
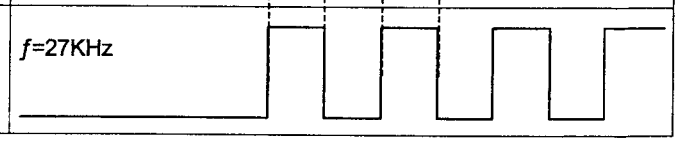
## 10-1. Wiring Diagram



# 10. Wiring Diagrams and Operating Sequence (continued)

## 10-2. Description of Operating Sequence

When oven is started, initial operating status is shown below figure.

| | Test point in circuit diagram | WAVE FORM |
|---|---|---|
| **Fan relay** | ⓐ on / off |  |
| **Lamp relay** | ⓑ on / off |  |
| **Power relay** | ⓒ on / off |  |
| **PWM output** | ⓓ on / off |   |
| **Out 1** | ⓖ on / off |   |
| **Out 2** | ⓗ on / off |   |

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